UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MICHIGAN
NORTHERN DIVISION

DOW CORNING CORPORATION et al.,

Plaintiffs,

v.

Case Number 11-10008-BC
Honorable Thomas L. Ludington

JIE XIAO et al.,

Defendants.
_____ /

OPINION AND ORDER GRANTING IN PART AND DENYING IN PART PLAINTIFFS' MOTION TO EXCLUDE EVIDENCE OF DEFENDANTS' EXPERT

The scientific method is premised on the search for replicable, predicable results. *See generally Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 593 (1993) ("Scientific methodology today is based on generating hypotheses and testing them to see if they can be falsified; indeed, this methodology is what distinguishes science from other fields of human inquiry."). Before expert scientific evidence may be admitted under Federal Rule of Evidence 702, the trial court must make a "preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue." *Id*. at 592–93.

In this trade secrets dispute, Dow Corning and Hemlock Semiconductor bring suit against Dr. Jie Xiao and four of his companies, LXE Solar, Inc., LXE Solar Ltd., LXEng LLC, and HXJ Science & Tech, Inc. Plaintiffs allege that Defendants misappropriated 17 of Plaintiffs' trade secrets and used that information to secure multi-million dollar contracts to build fluid bed reactors for foreign firms.

Plaintiffs and Defendants have each retained expert witnesses, and the Court has appointed a neutral expert as well. Plaintiffs now move to exclude the evidence of Defendants' expert, Mr. Stephen Lord. When questioned about his methods of evaluating some of Plaintiffs' claimed trade secrets, he responded that the calculations were "not a science, it's a little rougher on the calculational side than you might think." Questioned about inconsistencies in his methods of evaluating some of Plaintiffs' other claimed trade secrets, he explained: "My opinion of consistency is [that it is] the hobgoblin of tiny minds. I'm not a believer in consistency."

The Federal Rules of Evidence, as noted, require more. The gentleman's evidence on these claims must be excluded. His evidence on other claims, however, has not been shown to be similarly unreliable. Accordingly, Plaintiffs' motion will be granted in part and denied in part.

I

A

Dow Corning manufactures polysilicon products, including trichlorosilane. In 1960, Dow Corning selected Hemlock, Michigan as the site for its polysilicon plant. In 1979, Dow Corning formed Hemlock Semiconductor, which manufactures polysilicon using Dow Corning's trichlorosilane. Dow Corning remains the majority shareholder of Hemlock Semiconductor today.

Michael Little was employed by Dow Corning for twenty five years as a chemical engineer. During this time Mr. Little was involved in the manufacture of both trichlorosilane and polysilicon. Indeed, for a period of time Mr. Little served as the leader of Dow's trichlorosilane production facility in Michigan. In this role, Plaintiffs assert, Mr. Little "learned certain process specifications and process design techniques including . . . the specifications and

characteristics for Dow Corning's fluid bed reactors." Compl. ¶ 27. Mr. Little also signed several contracts with Dow Corning promising not to disclose "any trade secret, confidential know-how or confidential business or technical information of Dow Corning." *Id.* ¶ 26. Mr. Little left Dow Corning in 2002.

B

Five years later, Dr. Xiao and Mr. Little formed LXEng, LLC. Each gentleman owned a 50 percent stake in LXEng. Although both gentlemen were chemists, only Mr. Little had expertise in the trichlorosilane and polysilicon industries. Dr. Xiao had worked in the pharmaceutical industry before joining LXEng.

Shortly after LXEng was formed, Plaintiffs allege, Mr. Little and Dr. Xiao disclosed Plaintiffs' trade secrets to prospective customers, including the specifications and characteristics of Dow Corning's first generation fluid bed reactors. And Plaintiffs allege that Mr. Little, who was also a pilot and photographer, conducted aerial surveillance of Plaintiffs' Michigan facility and used that information in sales pitches to prospective clients. As a result, Plaintiffs further allege, LXEng secured contracts worth as much as $18.4 million to provide trichlorosilane and polysilicon technology to two foreign companies. LXEng also entered into negotiations with two other foreign companies for contracts worth as much as $12 million.

Mr. Little died in November 2007, when the single-engine plane he was flying crashed near Gladwin, Michigan.

C

Five months later, Dow Corning's counsel wrote a letter to LXEng. Expressing concern that Mr. Little may have shared Dow Corning's trade secrets with LXEng's customers, the letter

emphasized Dow Corning's intent to protect its intellectual property rights. The letter also asked LXEng to consent to an inspection of Mr. Little's laptop computer. The request was refused.

Around this time, Dr. Xiao was approached by Woongjin Polysilicon Co., Ltd. "To keep this new contract free of any possible liabilities of LXEng caused by Michael Little," Defs.' Third-Party Compl. ¶ 7, Dr. Xiao formed LXE Solar in the Caribbean nation of Nevis in July 2008. Dr. Xiao is the only shareholder of LXE Solar. He placed the new company's funds in a bank account in the Republic of Seychelles. Less than a month after LXE Solar's formation, it secured a $10 million contract with Woongjin.

A short time later, the Seychelles government froze LXE Solar's account and alerted U.S. authorities. The FBI began a criminal investigation and a grand jury empanelled in the Southern District of Florida issued subpoenas for documents and electronic information held by Dr. Xiao, LXEng, and LXE Solar.

The FBI contacted Dow Corning and invited them to view the documents suspected of containing Dow Corning's trade secrets. Eventually, the Seychelles account was released. The grand jury did not indict Dr. Xiao, LXEng, or LXE Solar.

D

In January 2011, Plaintiffs filed a seven-count complaint against Dr. Xiao, LXEng, and LXE Solar. The claims included misappropriation of trade secrets under Michigan law; trademark infringement in violation of the Lanham Act; false advertising, false representation, and unfair competition in violation of the Lanham Act; trademark dilution in violation of the Lanham Act; unfair competition in violation of Michigan law; violations of the Michigan Uniform Trade Practices Act; and tortious interference with a contract in violation of Michigan law.

Dr. Xiao, LXEng, and LXE Solar moved to dismiss the complaint. Granting the motion in part and denying it in part, the Court dismissed Plaintiffs' trademark claims and Michigan Consumer Protection Act claims, but permitted the trade secret, false advertising, unfair competition, and tortious interference claims to proceed. *Dow Corning v. Xiao*, No. 11-10008, 2011 WL 2015517 (E.D. Mich. May 20, 2011).

In April 2012, Plaintiffs deposed Dr. Xiao and learned that he had formed two other companies: LXE Solar Ltd., formed in the British Virgin Islands; and HXJ Science & Tech Inc., formed in China. Dr. Xiao is the sole owner of the two companies.

Plaintiffs moved for leave to join these two entities as defendants and to amend the complaint. ECF No. 135. In September 2012, the motion was granted in part and both entities were joined as defendants. ECF No. 148.

Also in September 2012, the parties filed a joint motion for the appointment of a neutral expert pursuant to Federal Rule of Evidence 706. ECF No. 147. The motion was granted, and the Court appointed Dr. Hugo Caram. ECF No. 149.

E

The parties, as noted, also retained their own experts. Plaintiffs retained the services of Dr. Liang-Shih Fan. He earned a Ph.D. in chemical engineering in 1975. Since 1978, he has been on the chemical engineering faculty at Ohio State University. Presently, he is the Distinguished University Professor and C. John Easton Professor in Engineering in Ohio State's department of chemical and biomolecular engineering. He specializes, among other things, in fluidization and multiphase flow.

Defendants retained the services of Mr. Stephen M. Lord. He earned a master's degree in chemical engineering in 1970. Since 1985, he has been the owner of SML Associates, a consulting firm. And since 2009, he has been the president of Lord Engineering Corp.

Mr. Lord's businesses are similar to those operated by Defendants. *See* Lord Dep. 22–23, Oct. 3, 2012, *attached as* Pls.' Daubert Mot. Ex. A. When someone is interested in setting up a trichlorosilane plant, for example, Mr. Lord's businesses will "sell them technology, technology package or equipment plus technology package." Lord Dep. 22.

Each gentleman has produced an expert report, as well as a rebuttal report responding to the other party's expert report. And each gentleman has been deposed.

Before turning to these documents, however, one note is in order. Because the parties' respective designs each contain confidential proprietary information, the discussion that follows addresses the experts findings while omitting specific design dimensions and technical specifications.

1

Dr. Fan's report begins by explaining that Plaintiffs asked him to answer three questions. First, "compare the fluid-bed reactor ('FBR') technology used by Plaintiffs with the FBR technology sold by Defendants . . . [and] opine on the similarities between these technologies." Fan Report ¶ 7, *attached as* Pls.' Daubert Mot. Ex. H. Second, "conduct a public literature search on some of the key features of the FBR technology used by Plaintiffs . . . [and] determine whether these features are in the public domain." *Id*. ¶ 8. And third, "evaluate the likelihood that similarities between Plaintiffs' and Defendants' FBR technologies could be independently derived from the public literature without extensive separate laboratory work and field testing." *Id*.

Dr. Fan's report answers the first question in the affirmative, the second and third in the negative. That is, he reports that the technologies are the same. The key features are not in the public domain. And the similarities could not be derived from proper sources without extensive testing.

a

Elaborating, Dr. Fan's report explains that not only are the respective fluid-bed reactor designs similar — they "are practically identical." *Id*. ¶ 13.

Dr. Fan explains: "Based on my review of the design parameters of the two reactors, I have concluded that the level of similarity between the two FBR technologies is beyond coincident. That is, it would be unusual and most unlikely that the two technologies could be developed independently and have the end result be so similar." Fan Report ¶ 18.

b

Turning to the second question, Dr. Fan concludes that "the details of the design, configuration, and operational conditions of Plaintiffs' fluid-bed reactor are not available in the public literature." *Id*. ¶ 12. Weaving in his answer to the third question, he explains that after reviewing "publicly-available patents, articles, and other documents," *id*., he has concluded:

> [C]ertain information about the general design and use of FBRs in the production of TCS and polysilicon is in the public domain. However, the details of the structure of the fluidized bed reactor and operational conditions remain confidential, in the possession of those companies who practice the arts. Thus, it would be very difficult, if not impossible, for anyone to develop commercially viable FBR technologies for TCS production based solely on information from the public literature, without detailed experimental tests, validation of the design, and extensive prior experimental and scale up work.

Id. ¶ 36. Dr. Fan also emphasizes that because the design details and operational conditions are not publically available, "the specifications and characteristics detailed above could only have

been developed by someone with detailed, non-public know-how and experience in operating fluid-bed reactors on a commercial scale." *Id*. ¶ 18.

Finally, Dr. Fan reiterates: "It is also highly unlikely that Defendants' fluid-bed reactor technology could have been independently derived without extensive field testing and experimental data." Fan Report ¶ 14. (There is no evidence that Defendants undertook such testing or experimentation. *See id*.)

2

The report of Defendants' expert, Mr. Lord, reaches an opposite set of conclusions. Mr. Lord's report begins by explaining that he was retained by Defendants "to review the specific claims of the Plaintiffs and evaluate if they were trade secrets and to evaluate if the Defendants had used the technology of the specific claims." Lord Report 2, *attached as* Pls.' Daubert Mot. Ex. B.

Mr. Lord answers both questions in the negative. Specifically, Mr. Lord concludes that of Plaintiffs' 17 claimed trade secrets, 10 "are merely engineering preference, fifteen of the claims have been previously disclosed in various patents, five of the claims can be calculated from third party data and four of the claims are standard engineering practice, so none of the specified claims are trade secrets." *Id*.

a

Elaborating, Mr. Lord explains that he started his review by conducting a public literature search, like Dr. Fan. *See id*. at 4. But unlike Dr. Fan, Mr. Lord found that "any proprietary information that Dow may have at one time possessed has been overcome by events and is now public knowledge." *Id*. at 14.

b

Mr. Lord's report then discusses each of Plaintiffs' 17 claimed trade secrets. Plaintiffs' fourth trade secret claim, for example, concerns the fluid bed reactor's height.

A fluid bed reactor's proper height, Mr. Lord explains in his report, is a product of "fluidization velocity and space time." Lord Report 48. And a patent obtained by Tom Barker (and assigned to Union Carbide) reveals that (1) the "preferred" fluidization velocities range from 3 centimeters/second to 7.5 centimeters/second; and (2) the "preferred space times" range from five seconds to five minutes. *Id*. (citing U.S. Patent No. 4,585,643 (Filed May 31, 1985) (issued April 29, 1986) ("'643 Patent")).

From this operational range, Mr. Lord calculated a hypothetical reactor height similar to that of the parties' reactors. Lord Report 49. For space time, he selected a value roughly in the middle of the "preferred" operative range. *Id*. For linear velocity, in contrast, he selected a value at the outermost edge of the preferred operative range. *Id*. Combined, these two values result in a height similar to the parties' reactors, leading him to conclude that the height of Plaintiffs' reactor is not a trade secret because a reactor's proper height is "readily ascertainable by proper means." *Id*.

c

Pivoting to address Dr. Fan's findings, Mr. Lord argues that the parties' designs are not "practically identical" — but downright dissimilar. He writes:

> Dr. Fan's main analysis is based on side-by-side comparison of the Plaintiffs' and Defendants' reactors using a diagram and a table, but his analysis only covers a portion of the reactor and a small number of design features. I have prepared a fuller comparison. . . .
>
> It can be seen when looking at [the] full range of features important to the design of an FBR reactor that none of the numbers are the same. . . . Thus, Dr. Fan's conclusion of similarity is not borne out upon deeper analysis.

Lord Report 16 (paragraph breaks omitted). Arguing in the alternative, Mr. Lord asserts that even if the designs are similar, the information is publically available. *Id*. at 19, 27. He writes:

> Dr. Fan's other important finding was that there were no commercial designs available in the public literature, but the Chinese [Institute drawing] contradicts this claim . . . . Thus, Dr. Fan's final conclusion that . . . Defendants could not have independently engineered the technology is clearly erroneous.

Id. at 19. Mr. Lord reiterates: "The fact that a reactor with similar dimensions would work is not a secret. The Chinese Institute drawing shows a [reactor with similar dimensions]." *Id*. at 27.

Summarizing his findings, Mr. Lord concludes: "After having read the expert report from Dr. Fan, my original conclusions are unchanged with regard to the technical aspects of the claims, all of which do not seem to be trade secrets." Lord Report 19.

3

Dr. Fan responded to Mr. Lord's report via a rebuttal report. *See* Fan Rebuttal, *attached as* Pls.' Daubert Mot. Ex. E. Addressing Mr. Lord's assertion that the reactors' dimensions are different, Dr. Fan writes: "Mr. Lord points to slight differences between the Defendants' reactor and the reactor used by Plaintiffs to attempt to argue that all reactor dimensions are interchangeable and that Plaintiffs' dimensions have no trade-secret value. The differences, however, are small and immaterial." *Id*. ¶ 5(b); *see also id*. ¶¶ 15–30 (specifying why the design differences are immaterial).

Turning to Mr. Lord's assertion that the information is in the public domain, Dr. Fan continues: "Although certain particular dimensions or specifications may appear in connection with descriptions of other fluid-bed reactor technologies, the unique combination of specifications and dimensions used by Plaintiffs do not appear in the public literature." *Id*. ¶ 5(c).

The Chinese Institute drawing, for example, Dr. Fan asserts is "different in significant ways." Fan Rebuttal ¶ 33. After enumerating the differences, Dr. Fan explains that the consequence is that the reactors fluidize particles differently. Specifically, the Chinese Institute drawing illustrates a "slugging" rather than "bubbling bed" reactor. *See id.* ("[T]he reactor designed by the Chinese Institute . . . [has] hydrodynamics and performance [that] are entirely different . . . . For example, [the Chinese Institute design] is characterized by solid concentration stratification, while [in the reactors used by Plaintiffs and sold by Defendant, such stratification will not occur. Thus, these are two different types of reactors."). Moreover, "the Chinese Institute drawing does not show any information about operational conditions, while the operational conditions for Defendants' and Plaintiffs' reactors, including temperature, pressure and particle size, are very similar, as stated above." *Id.*

Summarizing his findings, Dr. Fan writes: "It is my conclusion that the design of the Defendants' fluid-bed reactor is substantially similar to that of Plaintiffs, and Plaintiffs' design is significantly different from the other designs that Mr. Lord identifies as being in the public domain." *Id.* ¶ 6.

4

Mr. Lord also prepared a rebuttal report. *See* Lord Rebuttal, *attached as* Pls.' Daubert Mot. Ex. C.

Responding to Dr. Fan's assertions regarding the Chinese Institute drawing, Mr. Lord counters that "fluidization characteristics are not part of the specific claims" and, even if they were, "the fluidization is the same" in the reactors. Lord Rebuttal 5–6. He writes that Plaintiffs' and Defendants' reactors "are not typical bubbling beds where the bubbles move up through the

solids and then burst at the surface but instead are slugging beds where the bubble lifts a section of the bed." *Id*. at 6.

Turning to how Defendants arrived at precisely the same reactor bed diameter as Plaintiffs, Mr. Lord writes that Defendants employed a "common industrial engineering practice of calculating the basic size, adding a safety factor, then rounding up to the nearest foot." *Id*. at 6. He elaborates that this "is a perfectly reasonable example of industrial engineering practice which simply requires easy hand calculations and a reasonable safety factor to ensure meeting the throughput requirements[1] of the client." *Id*. at 8.

Summarizing his conclusions, Mr. Lord writes that "in multiple ways" Plaintiffs' "claimed trade secrets [a]re not trade secrets according to the legal definition." *Id*. at 21.

5

In October 2012, Mr. Lord was deposed. Although a range of subjects were covered, much of the conversation centered on fluid bed reactor dimensions.

a

Plaintiffs' second claimed trade secret, for example, concerns the reactor diameter. (The reactors that Plaintiffs use and Defendants sell have identical diameters.)

The diameter of a fluid bed reactor, Mr. Lord initially asserted in his deposition, is "very strongly dependent on particle size." Lord Dep. 48–49.

Defendants' reactor was initially designed with a particle size of 80 microns — allegedly. *See* Little Email, *attached as* Pls.' Daubert Mot. Ex. G. The reactors that Defendants actually built, however, used much coarser particles (with diameters ranging from 150 to 250 microns). *See* Lord Report 16.

[1] "Throughput" is defined by *Webster's Dictionary* as "an amount of raw material put through processing or finishing operations in a specific time." *Webster's Third International Dictionary* 2385 (unabridged ed. 2002).

Nevertheless, Defendants did not change the diameter of the reactor — instead, they kept the same diameter as Plaintiffs. In his deposition, Mr. Lord was asked:

> Q: In your professional judgment, if you had made a decision at this point to change from an 80 micron diameter particle to a — let's keep it simple — to 150 micron particle, would you have rerun this basic calculation to resize the reactor?
>
> A: No. I don't think I would, in actual fact. I think what I would have done is I would have looked at the minimum fluidization for that particular particle and see whether or not the velocity through there was still significantly above the minimum fluidization velocity. . . . So I would probably have gone back and said okay, I'm operating pretty high velocity any way, can I — can I still fluidize a bigger particle? And if I could, I would say you can try and probably be okay.
>
> Q: Do you have any idea whether you would still be able to fluidize a particle?
>
> A: Not without doing some calculations, no.
>
> Q: . . . [D]oes your opinion change if we use the upper end of the range you provided if you knew you were going to run 250 micron particle —
>
> A: Like I said, I would do the calculation and then I would know. I haven't done them.

Lord Dep. 223–25. Thus, Mr. Lord acknowledges that he does not know whether Defendants' decision to keep the same diameter although they were using particles two to three times larger than originally planned was reasonable. He did not do the math.

b

Mr. Lord also opined in his deposition that designing a reactor diameter was not a precise science, explaining: "There's a reasonable variation in what the diameter can be. . . . You could certainly round up, round down." Lord Dep. 47–48. Asked how much rounding would be reasonable, Mr. Lord responded: "Probably about — maybe 15 percent of the diameter,

something like that, 10 to 15 percent of the diameter. . . . Probably, you know — probably at least 15 percent. There's — there's a lot of flexibility in actual fact." Lord Dep. 48–49.

This sort of "flexible" calculation, as noted, resulted in Defendants arriving at precisely the same reactor diameter as Plaintiffs, according to Mr. Lord's rebuttal report. More particularly, his rebuttal report asserts that Defendants used the "common industrial engineering practice of calculating the basic size, adding a safety factor, then rounding up to the nearest foot." Lord Rebuttal 6.

To illustrate that Defendants calculated the diameter of their reactor according to this formula, Mr. Lord ran the numbers himself. *See id*. at 7 (showing Mr. Lord's calculations). In his deposition, Mr. Lord explained that after he accepted Defendants' basic size calculation, he added "the fudge factor." Lord Dep. 235. He elaborated: "You know there are supports in there . . . you know you probably are going to be around 10 percent, it's typical." Lord Dep. 235–36. Plaintiffs' counsel inquired:

> Q: Was there any — I mean did you do any calculations to determine whether 10 percent was an appropriate estimate?
>
> A: No. And that's not typically done. You know it's not zero. And if you don't put something in you're going to be wrong for sure. So 10 percent is a reasonable — no one is going to occupy the entire reactor in supports, people are going to try and minimize the support area. So 10 percent is probably reasonable. At this level of calculation, early design phase.
>
> Q: So once you got [this calculation], the next — so you apply yet another I guess safety margin or fudge factor. Is that correct?
>
> A: Well, what I did was I calculated what the cross-sectional area needed to be, include for the — for the support — for the tubes, plus a reasonable allowance for the supports . . . and then back-calculated the diameter.

Lord Dep. 239. After completing this calculation, Mr. Lord testified in his deposition, he applied an additional "fudge factor." Lord Dep. 239. After adding this, he rounded off to the nearest

foot — "a nice round number." Lord Dep. 240. This, he acknowledged, resulted in a safety margin of 23 percent. Lord Dep. 239.

When Plaintiffs' counsel asked whether Mr. Lord had "any literature" suggesting that rounding off to the nearest foot is an appropriate manner of calculating the diameter of a fluid bed reactor, he responded:

> I don't know — I certainly can't point to it sitting here. I just know that's typical engineering practice. If you don't — if you . . . go to some obscure number . . . people think you're crazy. And part of it is, there is a lot of unknowns in these calculations. . . . So people tend to round up and have a bit more volume, a bit more capacity, so that it's going to work.

Lord Dep. 242. Asked whether a 23 percent safety margin was unusual (given that the "typical" safety factor margin was 15 to 20 percent), Mr. Lord responded:

> Of course, it's a typical safety margin. These are rough — these are rules of thumb. These are not cast in concrete. So you look at it and say, okay, that's pretty reasonable and you move on. This is — you are designing a whole chemical plant in a few weeks. You are not going to sit around arguing about it, it was only 15 percent and we can shave a penny off the price. It doesn't matter at that point.

Lord Dep. 247. (Mr. Lord did not elaborate on whether it was a "typical engineering practice" to design "a whole chemical plant in a few weeks.") Probing deeper into the safety margin issue, counsel for Plaintiffs asked:

> Q: At what point does a safety margin become too big, in your opinion?
>
> A: Probably 40 percent.
>
> Q: 40 percent. So 30 percent would be okay?
>
> A: Yeah. Probably you would be saying well, we're spending — can we afford to do it, kind of thing.
>
> Q: So at the end of all these mathematical calculations I can increase the number by 40 percent and come up with the same reactor?

> A: You won't come up with the same reactor. You'll come up with a bigger reactor. Yeah. It's not an art, it's not a science, it's a little rougher on the calculational side than you might think.

Lord Dep. 248. Returning to Mr. Lord's assertion that calculating fluid bed reactor dimensions is "not a science," Plaintiffs' counsel inquired:

> Q: So as you said before, it's [not] a science — it's an art and it's not a science, right?
>
> A: Yeah. You do some basic calculations and you get close to the number you think it probably is and say okay, what's convenient to build it with? That's what [Plaintiffs' engineers] did. You read the e-mails. They always are chopping bits off and putting some stuff on and trying some new thing in the plant.
>
> Q: Making it —
>
> A: — hands-on, you know, playing around and stuff.
>
> Q: — making adjustments based on their experience with the piece of equipment?
>
> A: Well, you could put it that way. Or you could say a whole bunch of engineers who were bored and wanted to change things, which is I think a little closer to the truth.
>
> Q: Is that why you make changes to your equipment, because you're bored and you want to change things?
>
> A: Yes. We have a bright idea one day and we said yeah, it would be really cool if we did that.

Lord Dep. 260–61. Turning to what "chemical engineers worry about," what they "actually really worry about," Mr. Lord explained: "We are worrying about mass heat transfer and fluid flow." Lord Dep. 263.

Mr. Lord later testified that to properly design a fluid bed reactor, it is necessary "to do the heat transfer calculations." Lord Dep. 342. But, he acknowledged, he did not do this calculation. He explained: "If I want to do a heat transfer calculation, that's real work. That's

complicated. You got to calculate all these properties and heat transfer coefficients. It's definitely a pain." Lord Dep. 341; *see also* Lord Dep. 332–33 (acknowledging that he did not do a heat transfer calculation). Plaintiffs' counsel followed up by asking:

> Q: How long would it take you to do a heat transfer calculation?
>
> A: Oh, God. Depending — depending on what tools were available, probably several days. It's complicated. You got to go through some iterative steps. It appeared that [Defendants' partner] had some tools, computer tools available to them that would be useful. I don't have those tools. So it would be difficult for me.

Lord Dep. 341. And finally, Mr. Lord further testified that in his regular professional consulting work he would not size a reactor's diameter according to the method he used in his report. Lord Dep. 299–300. In his deposition, he was asked:

> Q: Would you recommend that anyone who is designing a commercial fluid bed reactor rely solely on the calculations you provided on page 7 of your rebuttal report to size the diameter?
>
> A: I wouldn't do it that way.

Lord Dep. 299–300.

c

Plaintiffs' fourth claimed trade secret regards the fluid bed reactor's height. In his report, Mr. Lord concludes that the "operational details" of a fluid bed reactor, including its height, are "well known to those skilled in the art." Lord Report 48. He bases this conclusion on the '643 Patent. *See* Lord Report 47–49; Lord Dep. 294.

Mr. Lord asserts, as noted, that the appropriate height of a fluid bed reactor is the product of space time multiplied by linear velocity. Lord Report 48. And the '643 Patent reveals that (1) the "preferred" fluidization velocities range from 3 centimeters/second to 7.5

centimeters/second; and (2) the "preferred space times" range from five seconds to five minutes. *Id*. (citing '643 Patent).

In calculating the height of Defendants' reactor, Mr. Lord chose a midpoint value for space time. Lord Report 49. But he chose an outlier value for linear velocity — one at the outermost edge of the operative range. *Id*. This resulted in a fluid bed reactor height similar to Plaintiffs' reactor. Pls.' Daubert Mot. 18. In his deposition, Mr. Lord was asked:

> Q: Did you try different iterations of this when you were preparing your report?
>
> A: No. I didn't try a whole bunch of different iterations. I just pointed out what you could do. The question is, is it readily ascertainable? To me it's readily ascertainable. Now, you could come up with a different number if you chose different options, yes. Undoubtedly, I won't disagree with that. But can you come up with a number? And the answer is yes. . . . [The '643 Patent] provides, you know, the necessary information for someone to make at least an initial calculation for what might be a reasonable height. And then you could then look at, you know — can you get all the heat exchange in there that you need and the other various, you know, engineering considerations? So it seemed reasonable that you could do that. I could — I mean I gave — it's a hand calculation. It's not a — you know, a — you know, a computer simulation. It's okay.

Lord Dep. 293–94. Pressing Mr. Lord on the variety of heights that he could have reached using the operational ranges of the '643 Patent, counsel for Plaintiffs inquired:

> Q: [I]n calculating if you plug those numbers into your equation at the top of the next page you would get a range, by our calculations, anywhere between 35 centimeters or 75 feet.
>
> A: Yeah. Yeah.

Lord Dep. 295–96. Following up, Plaintiffs' counsel asked "would you consider that to be a substantial range?" Lord Dep. 296. "I mean, I think that's almost identical," Mr. Lord dryly replied. Plaintiffs' counsel, returning to the precise numbers that Mr. Lord chose, inquired:

> Q: Why is it reasonable in one case to [choose] the high end and the other case to choose the midpoint?

A: Because engineering is not particularly a logical thing. It's an art. And okay, this is — there is a lot of feel to it, I suppose. It seemed to me — I've had a fair bit of experience in fluidized beds over the years, running and operating and designing them. . . .

Q. You didn't think it was important to be consistent in your assumptions over the course of the calculation?

A: No. My opinion of consistency is [that it is] the hobgoblin of tiny minds. I'm not a believer in consistency.

Lord Dep. 339–40.

d

Plaintiffs' eighth claimed trade secret is a combination claim — specifically, that the reactor design will work as promised.

Similar to Plaintiffs' eighth claim, the Chinese Institute drawing involves a combination of elements that allegedly depict a working reactor. Dr. Fan asserts that while the Chinese Institute drawing depicts a reactor — it depicts a fundamentally different type of reactor than the type used by Plaintiffs and sold by Defendant. Fan Rebuttal ¶ 33. Specifically, the Chinese Institute drawing illustrates a "slugging" rather than "bubbling bed" reactor. *See id.*

Mr. Lord's rebuttal report agrees that the Chinese Institute drawing depicts a slugging reactor, but contends that the reactor Plaintiffs use and Defendants sell are likewise "firmly in the slugging regime." Lord Rebuttal 28.

In his deposition, Mr. Lord explained: "I took the position based on the calculations I did that they were all essentially in the same fluidization regime." Lord Dep. 192. When pressed on the question by Plaintiffs' counsel, however, he acknowledged: "I haven't done the calculations that [Plaintiffs' expert, Dr. Fan,] talks about, so I could be — I could be wrong, but I believe that if those calculations were done for all . . . of the reactors, they would show them all to be in

essentially the same flow issue." Lord Dep. 194. Later in the deposition, Plaintiffs' counsel returned to the issue, asking:

> Q: I want to return briefly to the discussion . . . about the calculations or the statements you made in your rebuttal report about — about Dow Corning and Defendants having a slugging as opposed to bubbling regime. At this point in time are you — is it your opinion still at this point in time that the Defendants reactor is a slugging reactor and not a bubbling bed reactor?
>
> A. I think I don't know for sure what their fluidization regime is. I think Dr. Fan had some good points. There is obviously different calculational procedures you could apply, different models, different ways of comparing things. . . . I think Dr. Fan brought up a point of having the internal — internals does make — could make a significant difference and could make it difficult to predict exactly what goes on. So I think that's a very good point. But nevertheless, the fluidization regime would be the same if the Plaintiffs' is bubbling, then the Chinese Institute one would be bubbling as well and probably the Defendants would be bubbling. So they will all be essentially the same fluidization regime, and that's what I was trying to say.

Lord Dep. 320–21. Mr. Lord further acknowledged that he "could perhaps have done a little more research in that area, but there wasn't really time and I didn't think it was particularly relevant." Lord Dep. 304.

F

By the parties' stipulation, the court-appointed neutral expert, Dr. Caram, has reviewed the expert reports and depositions and evaluated the Plaintiffs' 17 claimed trade secrets. And in December 2012, Dr. Caram produced a report of his own.

1

Dr. Caram's report concludes that of the Plaintiffs' 17 claimed trade secrets, four are not in the public domain, not ascertainable by proper means, and derive value from not being publically known. *See* Caram Report 3.

Discrete elements of the fluid bed reactor's design make up the first three viable claims. These elements are the reactor's: (1) cone angle; (2) diameter; and (3) hydrogen chloride and silicon injection sites. *Id*. Plaintiffs' combination claim — that the reactor design will work as promised — is the fourth viable claim. *Id.*

2

Dr. Caram next concludes that Defendants "used some of the identified trade secrets in their fluid reactor technology sold to third parties." *Id*. at 4. That is, Defendants did not "independently design these trade secrets in their fluid-bed reactor for TCS production by using publicly-available information [or] engineering expertise." *Id*. Dr. Caram writes:

> The Defendants used some publically available information, engineering expertise and third-party engineering and industry experience for the FBR design. However, in two critical areas . . . they have not provided a clear engineering explanation on how they arrived at their design choices. Therefore, it is highly likely that they used M. Little's experience and recommendations in the design process.

Id. One of the two "critical areas" identified by Dr. Caram is the reactor's diameter. Explaining why he believes that Defendants did not independently arrive at this dimension, Dr. Caram writes: "The Defendants marketed a well-defined performance [estimate] but only used either a crude engineering approach to determine the reactor diameter, or previous knowledge, and ignored all potential problems." *Id*. He continues: "There was no scale up of the design of the LXE reactors. Instead the designers used exactly the same diameter of the Dow reactors with the knowledge that it would work." Caram Report 6. Similarly, Dr. Caram notes:

> While there is agreement between the expert witnesses for the plaintiff and defendant that the reactor diameters are equivalent there is no clear explanation on how the defendants arrived at the [same] diameter [as Plaintiffs]. . . .
>
> I believe it extremely unlikely that the defendants arrived at this reactor diameter independently, and most likely used M. Little's information to make informed choices about the reactor design, that could not have been reached without

> significant testing. The explanations provided by the defendant[s] are not satisfactory.

Id. at 7. Dr. Caram summarizes: "While not an exact replica of one another, the DOW and LXE reactors are quite similar and functionally identical. . . . My conclusion is that the basic design characteristics . . . came through M. Little to [Defendants]." *Id*. at 12, 13.

Dr. Caram further concludes that two of the fluid bed reactor's basic design characteristics each qualify as "a radical design decision and one that under normal circumstances would not have been made without careful experimental and theoretical study. . . . These two basic design characteristics were not public information and could not be easily ascertained by a practitioner in the field." *Id*. at 13.[2]

G

Plaintiffs, as noted, now move to exclude the testimony, reports, and opinions of Mr. Lord.

II

As a threshold matter, Plaintiffs' motion does not challenge Mr. Lord's qualifications as an expert. Rather, it challenges the methods that he employed in this case. And it challenges the legal conclusions that he reached.

The motion thus centers on two Federal Rules of Evidence, Rules 702 and 704, which govern the admissibility of expert evidence and opinions embracing ultimate issues. Each is discussed in turn. Then each is applied to Mr. Lord's evidence.

A

Rule 702 establishes the general standards for the admissibility of expert evidence. It provides:

[2] The reactor's diameter is one such "radical design decision" identified by Dr. Caram. Its height is not. Indeed, Dr. Caram concludes that the height is "readily accessible through proper means." Caram Report 3.

> A witness who is qualified as an expert by knowledge, skill, experience, training, or education, may testify in the form of an opinion or otherwise if:
>
> (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
>
> (b) the testimony is based on sufficient facts or data;
>
> (c) the testimony is the product of reliable principles and methods; and
>
> (d) the expert has reliably applied the principles and methods to the facts of the case.

Fed. R. Evid. 702. Under the rule, the Supreme Court instructs: "The subject of an expert's testimony must be scientific knowledge." *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 589–90 (1993); *see also Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. 137, 150 (1999) ("Engineering testimony rests upon scientific foundations.").[3]

And the rule, the Court further instructs, "imposes a special obligation upon a trial judge to ensure that any and all scientific testimony is not only relevant, but reliable." *Kumho Tire*, 526 U.S. at 147 (quotation marks and ellipsis omitted) (quoting *Daubert*, 509 U.S. at 589).

"The adjective 'scientific,'" the Court explains, "implies a grounding in the methods and procedures of science. Similarly, the word 'knowledge' connotes more than subjective belief or unsupported speculation." *Daubert*, 509 U.S. at 590; see id. at 593 ("[T]he criterion of the scientific status of a theory is its falsifiability, or refutability, or testability." (brackets omitted) (quoting Karl Popper, *Conjectures and Refutations: The Growth of Scientific Knowledge* 37 (5th ed. 1989))). This much is, perhaps, self-evident. What is less immediately obvious how to determine whether the scientific testimony is "reliable."

[3] *See generally* Jeffrey S. Parker, *Daubert's Debut: The Supreme Court, the Economics of Scientific Evidence, and the Adversarial System*, 4 Sup. Ct. Econ. Rev. 1, 17-18 (1995) ("The Court's opinion [in *Daubert*] resolves the Rule 702 standard into two distinct aspects: (1) whether the proffered evidence is 'scientific knowledge,' which means, in essence, that it was arrived at through the scientific method; and (2) whether the evidence 'will assist the trier of fact to understand or determine a fact in issue,' which means that there is an adequate 'fit' or 'valid scientific connection' to the factual issues in the litigation.").

"Many factors will bear on the inquiry," the Court observes. *Daubert*, 509 at 593. In *Daubert*, however, the Court identifies four factors in particular. *Id*. at 593–94. The first factor — "a key question to be answered in determining whether a theory or technique is scientific knowledge" — is whether the theory or technique "can be (and has been) tested." *Id*. at 593. The second is "whether the theory or technique has been subjected to peer review and publication." *Id*. The third is whether the theory or technique has a "known or potential rate of error and the existence and maintenance of standards controlling the technique's operation." *Id*. at 594. And the fourth is whether the theory or technique has gained "general acceptance" in the "relevant scientific community." *Id*.

And several other factors are identified in the advisory committee notes to Rule 702. One is: "Whether the expert is being as careful as he would be in his regular professional work outside his paid litigation consulting." Fed. R. Evid. 702 advisory committee notes (2000 amend.) (quotation marks omitted) (quoting *Sheehan v. Daily Racing Form, Inc.*, 104 F.3d 940, 942 (7th Cir. 1997)).

A second is: "Whether the expert has unjustifiably extrapolated from an accepted premise to an unfounded conclusion." Fed. R. Evid. 702 advisory committee notes (2000 amend.); *see Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997) (observing that a court "may conclude that there is simply too great an analytical gap between the data and the opinion proffered").

And a third is: "Whether experts are proposing to testify about matters growing naturally and directly out of research they have conducted independent of the litigation, or whether they have developed their opinions expressly for purposes of testifying." Fed. R. Evid. 702 advisory committee notes (2000 amend.) (quotation marks omitted) (quoting *Daubert v. Merrell Dow Pharms., Inc.*, 43 F.3d 1311, 1317 (9th Cir. 1995)); *see also Mike's Train House, Inc. v. Lionel,*

L.L.C., 472 F.3d 398, 408 (6th Cir. 2006) (cautioning district courts to be "suspicious of methodologies created for the purpose of litigation, because expert witnesses are not necessarily always unbiased scientists").

"The objective" of each of these factors, as noted, "is to ensure the reliability and relevancy of expert testimony. It is to make certain that an expert, whether basing testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field." *Kumho Tire*, 526 U.S. at 152.

"Red flags that caution against certifying an expert," the Sixth Circuit cautions, "include reliance on anecdotal evidence, improper extrapolation, failure to consider other possible causes, lack of testing, and subjectivity." *Newell Rubbermaid, Inc. v. Raymond Corp.*, 676 F.3d 521, 527 (6th Cir. 2012) (citing *Best v. Lowe's Home Ctrs., Inc.*, 563 F.3d 171, 177 (6th Cir. 2009)).

B

Rule 704, in turn, provides: "An opinion is not objectionable just because it embraces an ultimate issue." Fed. R. Evid. 704(a). But an opinion is objectionable when it offers not a factual opinion — but a legal one. *E.g.*, *Berry v. City of Detroit*, 25 F.3d 1342, 1353 (6th Cir. 1994). The Sixth Circuit, for example, cautions: "Although an expert's opinion may embrace an ultimate issue to be decided by the trier of fact, the issue embraced must be a factual one." *Id.* (citation, brackets, and quotation marks omitted) (quoting Fed. R. Evid. 704(a))). As that court explains:

> It would have been easy enough for the drafters of the Federal Rules of Evidence to have said that a properly qualified expert may opine on the ultimate question of liability. They did not do so. When the rules speak of an expert's testimony embracing the ultimate issue, the reference must be to stating opinions that suggest the answer to the ultimate issue or that give the jury all the information from which it can draw inferences as to the ultimate issue. We would not allow a

> fingerprint expert in a criminal case to opine that a defendant was guilty (a legal conclusion), even though we would allow him to opine that the defendant's fingerprint was the only one on the murder weapon (a fact). The distinction, although subtle, is nonetheless important.

Id.; *see also Jones v. Pramstaller*, 874 F. Supp. 2d 713, 720 (W.D. Mich. 2012) ("The principle that an expert may not make legal conclusions is indeed well established.").

C

Portions of Mr. Lord's proposed evidence — specifically, the portions of his opinions regarding Plaintiffs second, fourth, and eighth claimed trade secrets — do not meet these standards. Nor do his conclusions that Plaintiffs' "claimed trade secrets [a]re not trade secrets according to the legal definition." Lord Rebuttal 21.

1

First is Mr. Lord's evidence regarding Plaintiffs' second claimed trade secret (concerning the reactor's diameter).

As noted, addressing how Defendants arrived at precisely the same reactor bed diameter as Plaintiffs, Mr. Lord writes in his rebuttal report that Defendants employed a "common industrial engineering practice of calculating the basic size, adding a safety factor, then rounding up to the nearest foot." Lord Rebuttal 6.

In his deposition, however, Mr. Lord acknowledged that he did not have a scientific foundation for his conclusion. When he was pressed on the method that he used to calculate the reactor's diameter, for example, he responded that "it's not a science, it's a little rougher on the calculational side than you might think." Lord Dep. 248. Later in the deposition, Plaintiffs' counsel returned to the topic, inquiring:

> Q: So as you said before, it's [not] a science — it's an art and it's not a science, right?

> A: Yeah. You do some basic calculations and you get close to the number you think it probably is and say okay.

Lord Dep. 260. Thus, by his own acknowledgement Mr. Lord's evidence on this claim is not "scientific." (As discussed below, moreover, Mr. Lord also acknowledged that in his regular professional consulting work he would not size a reactor's diameter according to the method he used in his report. Lord Dep. 299–300. Thus, he cannot rely on practical experience as a justification for the method he employs in his report.)

Nor has Mr. Lord's method of sizing a fluid bed reactor's diameter been subject to peer review or publication. In his deposition, Mr. Lord was asked if he was aware of any authority suggesting that rounding off to the nearest foot is an acceptable manner of calculating the diameter. He responded:

> I don't know — I certainly can't point to it sitting here. I just know that's typical engineering practice. If you don't — if you . . . go to some obscure number . . . people think you're crazy. And part of it is, there is a lot of unknowns in these calculations.

Lord Dep. 242. Addressing what "chemical engineers worry about," what they "actually really worry about," Mr. Lord explained: "We are worrying about mass heat transfer and fluid flow." Lord Dep. 263. And he testified that to properly size a reactor's diameter it is necessary "to do the heat transfer calculations." Lord Dep. 342.

But Mr. Lord didn't do these calculations. Lord Dep. 332–33, 342. He explained: "It appeared that [Defendants' partner] had some tools, computer tools available to them that would be useful. I don't have those tools. So it would be difficult for me." Lord Dep. 341. He elaborated: "If I want to do a heat transfer calculation, that's real work. That's complicated. You got to calculate all these properties and heat transfer coefficients. It's definitely a pain." Lord Dep. 341.

Thus, Mr. Lord again acknowledges that his evidence on an essential calculation for sizing a reactor's diameter is not scientific, but speculative. He does not know whether Defendants could have sized their reactor diameter by proper means. He didn't do the math to check.

Mr. Lord also acknowledged that in his regular professional consulting work he would not size a reactor's diameter according to the method he used in his report. Lord Dep. 299–300. In his deposition, he was asked:

> Q: Would you recommend that anyone who is designing a commercial fluid bed reactor rely solely on the calculations you provided on page 7 of your rebuttal report to size the diameter?
>
> A: I wouldn't do it that way.

Lord Dep. 299–300. As noted, one factor courts may consider in evaluating whether an expert's evidence is reliable is if "the expert is being as careful as he would be in his regular professional work outside his paid litigation consulting." Fed. R. Evid. 702 advisory committee notes (2000 amend.) (quotation marks omitted) (quoting *Sheehan v. Daily Racing Form, Inc.*, 104 F.3d 940, 942 (7th Cir. 1997)). Here, by his own acknowledgement, Mr. Lord was not.

2

Mr. Lord's evidence regarding Plaintiffs' fourth claimed trade secret (concerning the reactor's height) will likewise be excluded.

A fluid bed reactor's proper height, Mr. Lord writes in his report, is a product of "fluidization velocity and space time." Lord Report 48. And he concludes that the "operational details" of a fluid bed reactor, including its height, are readily ascertainable by proper means because of the '643 Patent. *Id*. That patent reveals that (1) the "preferred" fluidization velocities

range from 3 centimeters/second to 7.5 centimeters/second; and (2) the "preferred space times" range from five seconds to five minutes. *Id*.

From this "preferred" operational range, as noted, Mr. Lord selected a midpoint value for space time, but an outlier value for linear velocity, which resulted in a reactor height similar to Plaintiffs' reactor. Lord Report 49. In his deposition, Mr. Lord was asked:

> Q: Did you try different iterations of this when you were preparing your report?
>
> A: No. I didn't try a whole bunch of different iterations. I just pointed out what you could do. The question is, is it readily ascertainable? To me it's readily ascertainable.

Lord Dep. 293–94. Pressing Mr. Lord on the variety of heights that he could have reached using the operational ranges of the '643 Patent, counsel for Plaintiffs inquired:

> Q: [I]n calculating if you plug those numbers into your equation at the top of the next page you would get a range, by our calculations, anywhere between 35 centimeters or 75 feet.
>
> A: Yeah. Yeah.

Lord Dep. 295–96. Plaintiffs' counsel, returning to the precise numbers that Mr. Lord chose, inquired:

> Q: Why is it reasonable in one case to [choose] the high end and the other case to choose the midpoint?
>
> A: Because engineering is not particularly a logical thing. It's an art. And okay, this is — there is a lot of feel to it, I suppose. . . .
>
> Q. You didn't think it was important to be consistent in your assumptions over the course of the calculation?
>
> A: No. My opinion of consistency is [that it is] the hobgoblin of tiny minds. I'm not a believer in consistency.

Lord Dep. 339–40. Setting to one side Mr. Lord's wit, by his own admission his height calculations are not based on science. And while his humor may amuse the trier of fact, his

evidence on Plaintiffs' fourth claimed trade secret would not assist the fact-finder in determining a fact in issue.

Mr. Lord's evidence regarding Plaintiffs' fourth claimed trade secret will be excluded pursuant to Rule 702.

3

Mr. Lord's evidence regarding Plaintiffs' eighth claimed trade secret (the combination claim that the reactor design will work as promised) will also be excluded pursuant to Rule 702.

In Mr. Lord's report, he asserts: "The fact that a reactor with similar dimensions would work is not a secret. The Chinese Institute drawing shows a [reactor with similar dimensions]." Lord Report 27.

Dr. Fan counters that the Chinese Institute drawing is "different in significant ways from the technology adopted by Defendants and Plaintiffs." Fan Report ¶ 33. After enumerating the differences, Dr. Fan explains that the consequence is that the reactors' respective kinetics, hydrodynamics, and performance "are entirely different. . . . [T]hese are two different types of reactors." *Id*.

Mr. Lord responds in his rebuttal report that "fluidization characteristics are not part of the specific claims" and, even if they were, "the fluidization is the same" in the reactors. Lord Rebuttal 5–6. All of the reactors, he asserts, are "firmly in the slugging regime." *Id*. at 28.

In his deposition, Mr. Lord explained: "I took the position based on the calculations I did that they were all essentially in the same fluidization regime." Lord Dep. 192. When pressed on the question by Plaintiffs' counsel, however, he acknowledged: "I haven't done the calculations that [Plaintiffs' expert, Dr. Fan,] talks about, so I could be — I could be wrong." Lord Dep. 194. Later in the deposition, Plaintiffs' counsel returned to the issue, asking:

> Q: I want to return briefly to the discussion . . . about the calculations or the statements you made in your rebuttal report about — about Dow Corning and Defendants having a slugging as opposed to bubbling regime. At this point in time are you — is it your opinion still at this point in time that the Defendants reactor is a slugging reactor and not a bubbling bed reactor?
>
> A. I think I don't know for sure what their fluidization regime is. I think Dr. Fan had some good points. There is obviously different calculational procedures you could apply, different models, different ways of comparing things. . . . I think Dr. Fan brought up a point of having the internal — internals does make — could make a significant difference an could make it difficult to predict exactly what goes on. So I think that's a very good point. But nevertheless, the fluidization regime would be the same if the Plaintiffs' is bubbling, then the Chinese Institute one would be bubbling as well and probably the Defendants would be bubbling. So they will all be essentially the same fluidization regime, and that's what I was trying to say.

Lord Dep. 320–21. Mr. Lord further acknowledged that he "could perhaps have done a little more research in that area, but there wasn't really time and I didn't think it was particularly relevant." Lord Dep. 304. He was asked:

> Q: As of now you don't have sufficient information to know whether either the Chinese Institute or the Plaintiff's reactor is a slugging regime as opposed to a bubbling bed?
>
> A: Dr. Fan brought up another set of calculations that could possibly be applied that might indicate a different answer with some — some degree of a mix of bubbling and slugging, depending on what equation you pick. So this is obviously, you know, an area where there is no clear answer, nor likely to be any clear answer. . . .
>
> But I think the answer — the point I'm trying to get to is when you come down to it, if something is geometrically all very similar and geometrically has — and has the same gas properties and say essentially flow rate and same particle size you would expect the fluidization would be the same, whatever it might be, it should be the same.

Lord Dep. 322–26. Mr. Lord acknowledged that he did not know the Chinese Institute drawing's flow rate or particle size. Lord Dep. 326; *see also* Fan Rebuttal ¶ 33 ("[T]he Chinese Institute drawing does not show any information about operational conditions, while the operational

conditions for Defendants' and Plaintiffs' reactors, including temperature, pressure and particle size, are very similar."). But, he asserted that "it doesn't really matter because you're not trying to — I'm not trying to duplicate the Chinese Institute process, you are looking at a reactor that would work." Lord Dep. 326.

Again, Mr. Lord's evidence does not demonstrate the "same level of intellectual rigor that characterizes the practice of an expert in the relevant field." *Kumho Tire*, 526 U.S. at 152.

First, Mr. Lord did not attempt to test his theory that the reactors' fluidization regime is the same. Compelled to acknowledge that his conclusion depends on variables that he did not determine, he further acknowledges that he does not know what the reactors' fluidization regime is.

As the Supreme Court observes: "Trained experts commonly extrapolate from existing data. But nothing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert." *Joiner*, 522 U.S. at 146. Here, as in *Joiner*, "there is simply too great an analytical gap between the data and the opinion proffered." *General Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997); see also *Newell Rubbermaid*, 676 F.3d at 527 (cautioning that "[r]ed flags" improper extrapolation, failure to consider other possible causes, lack of testing, and subjectivity."

Mr. Lord's evidence regarding Plaintiffs' eighth trade secret claim is inadmissible.

4

Finally, Mr. Lord's legal conclusions will be excluded pursuant to Rule 704. In his report, he writes that of Plaintiffs' 17 claimed trade secrets, 10 "are merely engineering preference, fifteen of the claims have been previously disclosed in various patents, five of the

claims can be calculated from third party data and four of the claims are standard engineering practice, so none of the specified claims are trade secrets." Lord Report 2.

Likewise, in his rebuttal report the gentleman writes that Plaintiffs' "claimed trade secrets [a]re not trade secrets according to the legal definition." Lord Rebuttal 21.

As Plaintiffs pointedly observe, "expert testimony about what constitutes a trade secret" is "clearly inadmissible," since it is "not the expert's role to instruct the jury on the applicable law." Pls.' Daubert Mot. 10 (brackets and quotation marks omitted) (quoting *Bausch & Lomb, Inc. v. Alcon Labs., Inc.*, 79 F. Supp. 2d 252, 259 (W.D.N.Y. 2000)).

D

In sum, Plaintiffs' motion will be granted in part and denied in part. Mr. Lord's evidence regarding Plaintiffs' second, fourth, and eighth claimed trade secrets will be excluded, as will his legal conclusions.

Against this conclusion, Defendants make several arguments. None have merit.

1

Defendants first assert that the "*Daubert* challenge is essentially moot," and Rule 702 gatekeeping is unnecessary, because Dr. Caram has been appointed as a neutral expert. Defs.' Resp. to Pls.' Daubert Mot. 4. "In exercising its gatekeeping function," Defendants write, "this Court should accept Dr. Caram's reliance on Mr. Lord's expertise and reliability." *Id.* Defendants' argument lacks merit as a matter of fact and law.

As a matter of fact, for example, Dr. Caram took issue with some of the methods employed by Mr. Lord, such as his method of sizing a reactor diameter. Dr. Caram found that the "choice of particle diameter and safety factors appears to be arbitrary." Caram Report 7. "I

found no evidence of any rational procedure," Dr. Caram likewise reports, "to arrive [at the] diameter." *Id*. at 9.

Even if Dr. Caram had concluded that all of Mr. Lord's methods are reliable, moreover, this Court would be required to evaluate the admissibility of the challenged evidence.

"The court must decide," Federal Rule of Evidence 104 provides, "any preliminary question about whether a witness is qualified, a privilege exists, or evidence is admissible." Fed. R. Evid. 104(a). Likewise, as the Court explained in *Daubert*, "under the Rules the trial judge must ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable." 509 U.S. at 589. The findings of a neutral expert such as Dr. Caram are helpful in making this determination. But those findings do not excuse this Court's duty of ensuring that Mr. Lord's evidence is admissible.

2

Next, Defendants argue that "the conclusions drawn from Plaintiffs' cherry-picked snippets of Mr. Lord's deposition testimony are both illogical and irrelevant. . . . Mr. Lord's analysis is both sound and thorough." Defs.' Resp. 1–2. Defendants elaborate: "Plaintiffs follow a potshot approach of attacking Mr. Lord, quoting isolated comments out of context and ascribing great significance to several of Mr. Lord's jocular statements. . . . *Daubert* does not exclude an expert's stab at humor." *Id*. at 11, 15.

Yet it is not the levity that Mr. Lord attempted to bring to the deposition that is at issue. It is the lack of scientific rigor that he brought to his analysis of Plaintiffs' second, fourth, and eighth claimed trade secrets. For reasons detailed above, his methods of evaluating these claims were not grounded in the methods or procedures of science.

3

Finally, Defendants argue that "Mr. Lord never testified that any of his conclusions were based on incorrect assumptions, never testified that he failed to do any necessary calculations and never engaged in any unsupported speculation." *Id*. at 20.

Contrary to Defendants' contention, Mr. Lord repeatedly acknowledged that he had not done necessary calculations.

Plaintiffs' second claimed trade secret, for example, concerns the reactor diameter. The diameter of a fluid bed reactor, Mr. Lord initially asserted in his deposition, is "very strongly dependent on particle size." Lord Dep. 48–49. Defendants designed a reactor based on a particle size of 80 microns, but built reactors with particles of 150 to 250 microns. Mr. Lord acknowledges that he does not know whether Defendants' decision to keep the same diameter although they were using particles two to three times larger than originally planned was reasonable. He did not do the math. Lord Dep. 223–25.

Turning to what "chemical engineers worry about," what they "actually really worry about," Mr. Lord explained: "We are worrying about mass heat transfer and fluid flow." Lord Dep. 263. Mr. Lord later testified that to properly design a fluid bed reactor, it is necessary "to do the heat transfer calculations." Lord Dep. 342. But, he acknowledged, he did not do this calculation. He explained: "If I want to do a heat transfer calculation, that's real work. That's complicated." Lord Dep. 341; *see also* Lord Dep. 332–33 (acknowledging that he did not do a heat transfer calculation).

III

Accordingly, it is **ORDERED** that Plaintiffs' motion (ECF No. 157) is **GRANTED IN PART AND DENIED IN PART**. Mr. Lord's evidence regarding Plaintiffs' second, fourth, and

eighth claimed trade secrets will be excluded, as will his legal conclusions regarding each of Plaintiffs' 17 claimed trade secrets.

Dated: March 13, 2013

s/Thomas L. Ludington
THOMAS L. LUDINGTON
United States District Judge

PROOF OF SERVICE

The undersigned certifies that a copy of the foregoing order was served upon each attorney or party of record herein by electronic means or first class U.S. mail on March 13, 2013.

s/Tracy A. Jacobs
TRACY A. JACOBS